

**REMARKS**

Favorable reconsideration is respectfully requested in view of the following remarks.

**I. Claim Status**

Claims 9-18 are pending in this application and stand rejected. Applicants have not amended the claims by way of this reply. Thus, there is nothing that would require further consideration and/or search, and hence no ground for refusing entry to this amendment. Therefore, the reply must be entered and considered after final rejection.

**II. Written Description Rejection**

Claims 9-18 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement for the reasons set forth in item 2 on page 2 of the Official Action. The Official Action argues that, while the specification discloses that the conductive filler present can be present in an amount of 30-70%, 33-68% and 35-68%, it does not provide support for "at least 30%" as such includes amounts greater than 30%, such as 70% and 90%, etc. This rejection is respectfully traversed.

To start, it is well established that US case law points out the specification need not describe the claimed

invention in *ipsis verbis* to comply with the written description requirement. In re Edwards, 568 F.2d 1349, 196 USPQ 465 (CCPA 1978). Instead, the test for sufficiency of written description is whether the disclosure reasonably conveys to the artisan that the inventor had possession at the time of filing of the subject matter which is claimed. M.P.E.P., Eighth Ed., Rev. 6 (September 2007) at § 2163, I, 2100-159, 1<sup>st</sup> column, 2<sup>nd</sup> paragraph.

This test may be satisfied by: (1) a reduction to practice; (2) a reduction to drawings/chemical formulas; (3) a disclosure of relevant identifying characteristics, such as structure or other physical and/or chemical properties, to sufficiently describe the claimed invention in full, clear, concise and exact terms; (4) a disclosure of functional characteristics coupled with a known or disclosed correlation between function and structure; (5) a sufficient description of a representative number of species; or (6) a combination of the above, sufficient to show the inventors were in possession of the invention. M.P.E.P. (Eighth Ed., Rev. 6 (September 2007) at § 2163,II, A, 3a(i)-(ii).

With respect to numerical range limitations, the analysis must take into account which ranges one skilled in the art would consider inherently supported by the discussion in the original disclosure. See, In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976), the ranges described in the original specification included a range of "25%-60%" and specific examples

of "36%" and "50%"; see also, M.P.E.P., Eighth Ed., Rev. 6 (September 2007) at § 2163.05 III. See, Union Oil of Cal. v. Atlantic Richfield Co., 208 F.3d 989, 997, 54 USPQ2d 1227, 1232-33 (Fed. Cir. 2000) (Description in terms of ranges of chemical properties which work in combination with ranges of other chemical properties to produce an automotive gasoline that reduces emissions was found to provide an adequate written description even though the exact chemical components of each combination were not disclosed and the specification did not disclose any distinct embodiments corresponding to any claim at issue. "[T]he Patent Act and this court's case law require only sufficient description to show one of skill in the . . . art that the inventor possessed the claimed invention at the time of filing."). See also, M.P.E.P., Eighth Ed., Rev. 6 (September 2007) at § 2163.05 III.

In the instant case, it is believed that the specification shows that Applicants were in possession of the metal/plastic hybrid having an electrically conducting and/or metallic filler present in a proportion greater than 30% by weight.

In this regard, it is agreed that the specification discloses that the conductive filler present can be present in an amount of 30-70%, 33-68% and 35-68%. However, it should also be noted that the specification at the bottom of page 4, states:

Depending on requirements, the proportions of low melting-point metal alloy and electrically conductive filler can be varied over a wide range, generally between 1 and > 95 % by weight, in particular between 10 and 80 % by weight and between 20 and 75 % by weight.

In order to achieve the greatest conductivity, experience has shown that the proportion of low melting-point metal alloy should lie between 20 and 50 % by weight, advantageously between 22 and 48 % by weight and in particular preferably between 25 and 45 % by weight.

Similarly, in the second paragraph on page 5, the specification states:

The overall proportion of the conductive components (low melting-point metal compound and/or filler) amounts as a rule to  $\geq 60$  % by weight, preferably  $\geq 70$  % by weight, in particular preferably  $\geq 80$  % by weight, whereby up to >95 % by weight is achieved.

It is believed that these disclosures implicitly support situations, in which the melting-point metal alloy could be 20% whereby the electrically conductive filler could be upwards of 75% or higher to thereby meet the preferred embodiment (set forth in the paragraph immediately above) of "up to >95 % by weight is achieved." In other words, it is believed that such disclosure constitutes at least (1) a reduction to drawings/chemical formulas; and (2) a disclosure of relevant identifying characteristics, such as structure or other physical and/or chemical properties, to sufficiently describe the claimed invention in full, clear, concise and exact terms, to show that Applicants were in possession of the claimed metal/plastic hybrid

having an electrically conducting and/or metallic filler present in a proportion greater than 30% by weight.

Further, at pages 8-10, specification describes working examples, including those having copper fibers/spheres as one component as a percentage weight, for example of: 40%, 50%, 55%, 60%, and 75%. It is believed that this disclosure constitutes a sufficient a reduction to practice, as well as, a sufficient description of a representative number of species sufficient to show the inventors were in possession of the claimed metal/plastic hybrid having an electrically conducting and/or metallic filler present in a proportion greater than 30% by weight. In doing so, the specification clearly provides examples wherein the electrically conducting and/or metallic filler is in a range of 30 to 75%, which is clearly encompasses and supports the at least 30% language.

Therefore, contrary, to the Official Action's position, the specification does provide written description support for a compound having the electrically conducting and/or metallic filler present in an amount of "at least 30%", including amounts greater than 30%, such as 70% and 90%, etc

Applicants respectfully submit that the specification provides full written description support for claimed invention. For this reason, the above written description rejection is believed to be untenable and should be withdrawn.

### **III. Anticipation Rejections**

#### IWASE

Claims 9-18 were rejected under 35 U.S.C. § 102(b) as anticipated by IWASE (US 4,882,227) for the reasons in items 2-3 on pages 3-4 of the Official Action. This rejection is respectfully traversed.

It is believed that the rejection should fall, because IWASE fails to disclose or suggest each and every feature of independent claim 9. In this regard, independent claim 9 recites:

A metal/plastic hybrid which comprises:

a thermoplastic,

a metal compound melting in the range between 100°C and 400°C, and

an electrically conducting and/or metallic filler in the form of a conductive fiber and/or particle in a proportion of at least 30% by weight, and is present jointly with the metal compound melting in the range between 100°C and 400°C in the hybrid as a fiber network.

Independent claim 16 contains requires the same language.

IWASE fails to disclose a metal/plastic hybrid in which the electrically conducting and/or metallic filler is present in the form of a conductive fiber and/or particle in a proportion of at least 30% by weight and is present jointly with the metal compound melting in the range between 100° to 400°C in the hybrid as a fiber network.

In this regard, IWASE does not disclose a fiber network as required in the claims. Instead, the composition in IWASE has straight fibers, as evident by the figures in IWASE.

The Official Action took the position that the fiber network would be automatically built once all these features would be fulfilled. Applicants respectfully disagree and submit that this is not true, because the fiber network is due to the special kind of treatment and composition in which the network is built. Since IWASE is silent about how to build the fiber network and IWASE uses straight fibers and IWASE uses a different kind of low melting alloy (that is not lead-free), it is believed that IWASE does not build a fiber network. Again, the figures in IWASE are evidence that the fibers in IWASE are straight fibers, and thus, they cannot inherently form the fiber network as required in the claims. For this reason, IWASE cannot anticipate claim 9 (or claim 16 which also recites the fiber network feature).

Further, it is believed that IWASE would not render obvious claim 9. Based on the teachings of IWASE, the skilled worker would try to avoid a fiber network, as he would instead use the straight fibers of IWASE.

Also, IWASE discloses a conductive resin composition comprising a low-melting point metal. However, it is worth noting that, due to a problem solved by the present invention, it is essential to have a low-melting metal which is free of lead, in

order to avoid toxicological risks of the resin. In contrast to the present invention, the composition in IWASE contains lead.

Lastly, as shown from col. 3, lines 59-62, it is essential for the resin in IWASE to not have conductive fibers greater than 30% weight. In this regard, IWASE states "if the content of the conductive fiber exceeds 30 weight% flowability and other properties of the conductive resin composition are degraded." (See line 55 of col. 3.) This stands in contrast to claims 9 and 16, which require the electrically conducting and/or metallic filler to be present in the form of a conductive fiber and/or particle in a proportion of at least 30% by weight. In this regard, it is believed that the metal/plastic hybrid of independent claims 9 and 16 distinguishes over the disclosure in IWASE. For this additional reason, IWASE fails to anticipate or render obvious claims 9 and 16.

For the above reasons, the rejection over IWASE should fall, because IWASE cannot be said to disclose or suggest the above noted feature of claims 9 and 16. Thus, claims 9 and 16, and all claims dependent thereon, are believed to be novel and patentable over IWASE. As such, the above 102(b) rejection over IWASE is untenable and should be withdrawn.

ITO

Claims 9-10 and 12-17 were rejected under 35 U.S.C. § 102(b) as anticipated by ITO (US 4,582,661) for the reasons in



items 4-5 on pages 4-5 of the Official Action. This rejection is respectfully traversed.

The rejection should fall, because ITO does not disclose or suggest the metal/plastic hybrids of independent claims 9 and 16 requiring: a thermoplastic, a metal compound melting in the range between 100°C and 400°C, and an electrically conducting and/or metallic filler. The combination of the low melting compound/alloy with a conductive fiber distinguishes the metal/plastic hybrid of claims 9 and 16 over the teachings in ITO.

Concerning ITO, the Official Action argues that the "metal compound" could include dibutyltin maleate (see page 5 of the Official Action, about the middle of the first paragraph). Applicants respectfully disagree. As understood from the description of the instant application, the claim term metal compound does not include an organic compound like the above-mentioned complex stabilizer (dibutyltin maleate) of ITO. Also, there would be a danger in using the above-mentioned complex stabilizer (dibutyltin maleate) of ITO in that such an organic based compound would react with the thermoplastic material which would be unacceptable for the claimed composition.

Further, Applicants acknowledge the Official Action's position on page 8 that the complex compound, i.e., dibutyl maleate, would melt while processing. While this may be true, this is not what is meant by metal compound as recited in the

claims, and as explained above. Secondly, this does not solder with copper for the network. The network according to the invention is built, because copper is being soldered with the low-melting metal compound to built up a copper-network within the thermoplastic resin. This feature is nowhere disclosed or suggested in the cited references.

For these reasons, the rejection over ITO falls, because ITO cannot be said to disclose or suggest the above-noted features of independent claims 9 and 16. Thus, claims 9 and 16, and all claims dependent thereon, are novel and patentable over ITO. Thus, the above 102(b) rejection over ITO is untenable and should be withdrawn.

KATSUMATA

Claims 9-18 were rejected under 35 U.S.C. § 102(b) as anticipated by KATSUMATA (US 5,554,678) for the reasons in item 6 on pages 5-6 of the Action. This rejection is traversed.

Concerning KATSUMATA, this patent relates to a different teaching, since the resin material used therein includes a carbonaceous material. As explained above, the use of a resin material having a carbonaceous material is different from Applicants' invention. Indeed, it should be noted that that carbon would inherently avoid the build-up of a network as required in the claims. Thus, based on the teachings KATSUMATA, a fiber network cannot be built by carbon containing masses as in

KATSUMATA, since the melting point of carbon would be much too high. Accordingly, the resins in KATSUMATA fail to explicitly or inherently form the fiber network as claimed.

Further, as noted in the last response, KATSUMATA discloses at col. 1, lines 66-67, as well as col.2, lines 1-2, clearly teaches that "when the conductive fiber is more than 30 weight %, the moldability deteriorates to result in an uneven dispersion of the fibers, which than cannot provide a practical molded article".

As such, KATSUMATA fails to disclose a metal/hybrid plastic in which the electrically conducting and/or metallic filler is present in the form of a conductive fiber and/or particle in a proportion of at least 30% by weight.

Thus, claims 9 and 16, and all claims dependent thereon, are novel and patentable over KATSUMATA. Thus, the above 102(b) rejection over KATSUMATA is untenable and should be withdrawn.

#### **IV. Conclusion**

In view of the above remarks, it is respectfully submitted that the present application is in condition for allowance and early notice to that effect is hereby requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact the undersigned attorney at the telephone number below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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